GENERAL INFORMATION

OCTOBER 1960

Soil Conservation

SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

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CONTENTS

"Productive land is our base. Everything we do, all we share, even whatever we amount to as a great and enduring people, begins with and rests on the sustained productivity of our agricultural land."
—HUGH HAMMOND BENNETT

COVER PICTURE.—H. H. Bennett displaying some of his garden produce, at his home near Falls Church, Va., in the summer of 1951, just a few months before his retirement from Government service.

Soil Conservation

EZRA TAFT BENSON
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

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TOM DALE, Editor

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Hugh Hammond Bennett

1881-1960

HUGH Hammond Bennett died of cancer in Burlington, N. C., July 7, 1960, at a mellow 79. He rests in the grass-green beauty of Arlington National Cemetery, the honored hero of a different kind of global war. With his passing, the extraordinary Bennett legend becomes an immortal page in the history of civilization.

Many there are to mourn. They will miss his wise counseling and easy companionability. He was my own dear friend. In a very real sense, he was a friend as well to all the world's millions toiling out on the land. For he was a messiah of the soil, in whose teachings lay hope of plenitude and peace for hungry and quarreling peoples.

In what is but the flicker of an eyelid on the face of Time, Hugh Bennett was able to halt and reverse the exploitative trend on American farms and ranches, and to stay the hand of ruin in many another nation brought low by ruthless plow, hoe, fire, and axe.

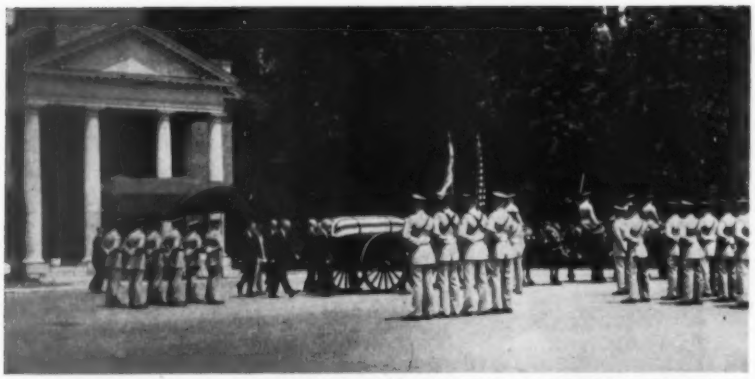
He was a man of action, an organizer, and an administrator who got the most out of men and dollars. He was a militant crusader of thunderous voice and flashing rapier. He was a shirtsleeve philosopher of prodigious memory and ready wit, a raconteur of the Mark Twain stripe. A practical psychologist, he knew how to deal with both the legislators on Capitol Hill and the executives in posts of government. And he was master of the art of communicating himself and his ideas to the mind and conscience of the people.

He was all of these things. But first and last, Hugh Bennett was a scientist—dedicated, inspired, and unique. As a young chemistry graduate of the University of North Carolina, he pioneered a form of research which led him into the dark jungles of ignorance and many a bureaucratic ambush.

His story has been told a thousand times in magazines, in newspapers, in books, on the air, and by neighbor to neighbor. Well do we know the epic studies he pursued in Virginia and the Carolinas, in Alaska, in Central and South America, in Africa. What he discovered confounded and sometimes embarrassed the established order.

It was not Bennett's chief aim to confound or embarrass his superiors. He was by no means the sort of iconoclast who delighted in smashing images, however false. But he was alarmed and appalled by steadily diminishing harvests, by the weakening agricultural complex, and by wasted, dying soils—and angered by the indifference to the catastrophe on the part of those who should have known better. He felt that his duty was to unveil the truth and collate the facts, no matter how damning the evidence or how disturbing the deductions might be to the whole existing formula for land management.

The young soil surveyor paid a big price for his tenacity and brashness. His reports were printed, discounted—and largely ignored. He began to supplement his official reports by scholarly papers in professional journals, by articles contributed to the farm press and general magazines, and by addresses before scientific bodies. Little by little, he fanned the flame of interest and concern. Gradually, he acquired a following, gained adherence of a hard core of



Horse-drawn caisson carries the body of H. H. Bennett to its final resting place in Arlington National Cemetary.

respected technicians and scientists.

After nearly a score of years of dogged effort came a dramatic breakthrough with publication of the celebrated "Soil Erosion, a National Menace." This bulletin made a convincing case against the crime of man's long war against Nature, exposed the thievery of sheet erosion. It was the blast that knocked down the remaining palace guard and smashed the bastion of complacency.

Over the Nation the oncoming shadow of trouble was compounded: the unsolved farm problem, the Great Depression, drought and Dust Bowl. Bennett was the outstanding leader with the knowledge, experience, courage, and vision to lead the fight against accelerated soil erosion. Congress and the White House tapped him for the job. First, he was to establish a system of experiment stations to continue the investigations he had begun. Next, he was enjoined to make erosion reconnaisance surveys and set up demonstration projects under WPA. Finally, with the praise of the President ringing in his ears, he was told to bring his Soil Conservation Service back over to his old Department of Agriculture as a permanent organization—an organization which was destined to become a model for most of the world.

Hugh Bennett went far beyond the simple mechanics for prevention of soil and water losses. He and his colleagues devised an entirely new philosophy of land management. It called for putting every acre to its proper use and treating it according to its needs. Its aim was as much production as protection — continuous, undiminished, most nearly maximum production. His transilient concept involved the whole agricultural ecology. In application it knew no separation of farm from farm by metes and bounds. And inevitably it led to the further revolutionary idea of soil conservation districts—those legal political entities which now are common to all States, and which constitute the most refreshing manifestation of grass-roots democracy of our day.

The soil conservation movement was the Hugh Bennett dream come true. It was sound, imaginative, challenging. It was swept along by a team of technicians and farm leaders who saw things as he did, were fanatically loyal, and shared his messianic zeal. He was proud of that team and its accomplishments.

Said the distinguished Paul Sears: "The campaign to protect and restore our soil is in some respects the most dramatic event in American peacetime history since the winning of the continent. It differs from all great national episodes which have preceded it in the degree and steadfastness with which it utilizes scientific knowledge."

Millions of men, women, and children came to know and love their idol. To them he was "The Chief" long before he was affectionately knighted "Big Hugh" by his biographer. He towered on the horizon heroic and invincible, a burly, homespun, big-hearted, crackerbarrel individualist who was equally popular and respected at ranch barbecue, civic club luncheon, and ivy-league tea party.

Showered with tributes, honorary degrees, medals, plaques, and citations, glorified by the professions, honored as no agricultural leader had even before been honored, Big Hugh retained his poise and perspective. He never lost faith in science on the one hand, or people on the other. He was always accessible, an eager welcomer of ideas. He kept the doors open to his office and his mind. His brand of research was humanized, uninhibited, imbued with his own heart, understanding, fluency, and courage. He had little patience with a science that was too smug, timid, or lazy to move boldly out to the service of humanity.

Hugh Bennett lives today in the land he succored and reinvigorated, and in the Soil Conservation Service which was his chosen instrument. We see him in the contoured landscape. He is in the song of mountain stream, the call of duck and quail, the rustle of wind in corner woodlot. He is in the hum of harvester, and in the lighted faces of country people. That is the way it will always be, for The Chief left this Nation the legacy of a stewardship that is for tomorrow and tomorrow and tomorrow.

—WELLINGTON BRINK

Note:—Wellington Brink is the author of "Big Hugh," the principal biography of H. H. Bennett. Mr. Brink was an information specialist and editor for the Soil Conservation Service for 20 years, until he left the Service in 1955. At present he is a contract writer and editor in Dallas, Tex.

What Others Say About
Hugh Hammond Bennett

"Great men usually are memorialized in stone or metal, but the earth itself is being carved into a memorial to Hugh Bennett."

Milwaukee Journal

"A sand fence in the Texas panhandle, a well-turned terrace in the Midwest, a row of trees in the South . . . remain, for Big Hugh Bennett, prideful memorials."

Charlotte Observer

"What Hugh Bennett taught us was that in our ignorance and blindness and almost in secrecy, the treasure of our lands and our lives can slip from beneath us—and suddenly be gone forever."

Raleigh News and Observer

"Few men have made any greater contribution to the economy of the Nation and the world than Dr. Hugh Hammond Bennett, former Chief of the U.S. Soil Conservation Service."

Mobile Press-Register

"In his lifetime, Bennett wore the mantle of greatness. He combined knowledge and vision with remarkable feats of persuasion. He was responsible, as nearly as one man can be, for changing the attitude of the Nation from indifference to active concern for its soil. He added 'topsoil' to the layman's vocabulary. He called it a priceless, irreplaceable heritage and made it stick."

WILLIAM E. RICHARDS

"Hugh H. Bennett had the good fortune to be acknowledged as a prophet in his own country and in his own time . . .

". . . His life work was not only in demonstrating the virtues of conservation, but also in demonstrating the rich rewards to be had in dedicated public service."

Washington Post

"In the field of soil conservation —and especially in the work of erosion control—Big Hugh knew what he was talking about, and . . . no representative of special interests could deter him in his dedication to the task of saving the soil so that it could be put to proper and productive use."

Daily Plainsman

"Future generations of Americans will have reason to be grateful to Dr. Hugh H. Bennett."

St. Louis Post-Dispatch

"Although much emphasis has been put on the simple, down-to-earth traits in Hugh Bennett's approach, any reporter of this man and his works must make one point unmistakably clear: that his bigness—of stature and mind—enabled him to move comfortably in any situation that confronted him. He was as much at home buying country butter at a crossroads store as he was selling soil conservation to a Princeton University assembly."

SANTFORD MARTIN

"Three volumes would be insufficient to tell in detail what Dr. Bennett has done during the last half century for his country and for the world. It is no exaggeration to say that this 'father of soil conservation' stands among the nation's most useful citizens."

New York Times

"Dr. Hugh Hammond Bennett was one of our great scientists, one of our great agriculturalists, one of our great crusaders. His vision, his knowledge, and his determination helped establish, within our lifetime, a national awareness of the urgency of protecting the soil as an essential but perishable natural resource. He was a man who knew and loved the land, but who loved mankind more."

EZRA TAFT BENSON

"Hugh Bennett was a man with a single purpose. He pursued that purpose tirelessly and relentlessly all of his life. For nearly half a century he carried on a militant crusade against soil erosion and on behalf of an action progam to protect and improve the nation's soil and water resources.

"More than any man, he was responsible for our national soil and water conservation and watershed protection programs that extend into virtually every corner of the United States, and for the development of similar programs in some 48 other countries."

DONALD A. WILLIAMS

Cranberry Production in the Pacific Northwest

By Earl R. Baker

FOUR years of hard labor, with an investment of around $3,500 an acre, are necessary before the first crop of berries is harvested from cranberry bogs in the Grays Harbor Soil Consevation District of western Washington.

This highly specialized crop is restricted to a small area in Pacific and Grays Harbor Counties, stretching along the beaches for nearly seven miles. This area produces 75 percent of Washington's cranberries.

The cranberry industry of this area started six years before Washington became a State, when Robert Chabot decided to try growing cranberries at Long Beach in 1883. He later moved to North Beach and started the first bog in that area in 1894. The original Chabot bog was reclaimed in 1934, and is still operating.

Drainage always has been a big problem in the cranberry bogs; so in 1900 the cranberry growers organized Pacific County Drainage District No. 1. Other growers noted the benefits of improved drainage. Fifteen years later Grays Harbor Drainage District No. 1 was organized to provide a main drainage ditch to the bay.

Although it now is the largest of the growing areas, the Grayland region was the last to begin. Ed Benn bought 160 acres at Grayland in 1912 for $5 an acre, later planting 3 acres to cranberries. The real founders of the Grayland cranberry industry, however, were seven Finnish settlers who purchased cranberry tracts in 1913-14. These early pioneers in the cranberry industry were: the Nyman Bros., John Jeikkila, John Lundgren, Arthur Raunanen, Henry Hanna, and Herman Joutsen.

Although this was the beginning of a great industry on the Washington coast, there were many problems and hardships to overcome through the years. John Niemi, an oldtimer in the Grayland area, says, "Many a time we lived on spuds, clams, and swamp water to get by."

Costs of clearing land were high. Work was done by hand labor, which was extremely time consuming. Modern equipment and methods of weed and insect control were not known. It cost from $750 to $1,000 an acre to clean up a weedy bog before World War II. As production problems were solved and new markets developed, more land was purchased and brought into production. Acreages increased until at present there are 178 growers raising cranberries on 550 acres of the highest producing bogs in the United States. Most of these growers are cooperators with their soil conservation district and receive technical aid from SCS technicians assigned to the district.

Following the selection of a desirable site for a bog, it is cleared of all trees, brush, roots, and sedges before it can be leveled and prepared for planting. As the clearing and leveling progress it is necessary to lay out and install a complete system of drainage ditches. These ditches serve a dual purpose of protecting the bogs from flooding during heavy rains and controlling the water table. An excess of water is injurious to the cranberry plants and excessive drainage causes a decomposition of the peat, which results in settling of a bog.

During the period following installation of the drainage system, most growers contact SCS engineers to design and lay out a sprinkler irrigation system. At that time a complete conservation plan is written for the entire farm. Water storage permits from the State are obtained to give the grower permission to store and use irrigation water.

The cranberry grower has a multipurpose use for his irrigation system. Water is stored in reservoirs and pumped over the entire bog through an overhead sprinkler system. This is done during dry weather and also during periods of extreme heat when the growing berries may become injured by heat scald.

A more important use of the sprinkler system, however, is for protection from frost during early spring and late fall. The system is controlled thermostatically to turn on immediately as the temperature over the bog dips to 32 degrees. The fine spray over the vines prevents injury to the cranberries, even with temperatures as low as 24 degrees. This type of irrigation system may cost as much as $1,000 per acre.

Following installation of the irrigation system, the field is prepared for planting. A small movable railroad track is laid the entire length of the bog to transport sand. The track is later installed permanently down the center of the bog. It is then used for spray equipment, resanding operations, and fertilizing and transporting the harvested crop to the warehouse.

Note:—The author is work unit conservationist, Soil Conservation Service, Montesano, Wash.

Pictures: (upper left) Clearing and scalping a cranberry bog on the Martin Paulson farm, near Grayland, Wash. (left center) Martin Paulson digging drainage ditch on his cleared bog. (lower left) Martin Paulson leveling the bog after drainage ditches were installed. (upper right) Cliff Marrs and his brother John spreading sand over their leveled bog, near Grayland, Wash. (right center) John Marrs planting cranberry vine cuttings on the bog, after sanding operations are completed. (lower right) Frank Echols of Grayland, Wash., harvesting cranberries with a Western picker.

During the slack seasons of early winter and spring the bog is thoroughly leveled. A layer of sand from three-quarters to one and one-half inches deep is applied. The uniform sand layer stimulates root growth of the plants. Cuttings of vines, obtained from local producing bogs, are then planted directly into the sand. Some machine planting has been done with homemade equipment. But R. J. Bailey, a local grower and supervisor of the Grays Harbor Soil Conservation District, says that four-fifths of the cranberry bogs in the area have been planted by hand.

Following planting of the bog, there is a four- to five- year waiting period before the first crop is ready for harvest. During this period of slow plant growth and after production begins, there are continuous problems of management confronting the grower. Good management includes such practices as fertilization, weed control, pruning of vines, frost and heat control, insect and disease control, irrigation, and crop harvest. The success of these practices largely determines the life of a bog and its production over the years. A bog under good management may last a hundred years or more.

Methods of harvest have advanced considerably over the years. Originally, harvesting was done by hand or with a hand scoop. As labor became a problem, the suction picker was developed. This machine is essentially a vacuum picker that plucks the berries from the vines by suction. Mechanical pickers have been developed recently that enable one man to pick as much as one-half acre per day. A combination of all three systems is now being used on many of the bogs.

As the crop is harvested the cranberries are transported on small flat cars over the railroad track to the warehouse near the homesite. Here the berries are cleaned, sorted, and placed in containers to await transport by truck to the local cannery for processing.

Over the years, through improvements in equipment and management, great strides in production have been made. The area under the management of one grower has increased from one or two acres in the early days to as high as 14 acres in some locations. Yields range from 75 to 300 barrels per acre. A barrel of cranberries weighs 100 pounds and sells for $12 to $13. Immediately after World War II, the price per barrel jumped to an all-time high of $32 a barrel.

All cranberries from this area were sold on the fresh market until 1941, when the growers in the Grayland area built their own cannery and processing plant at Markham. The Markham plant processes all the berries grown in Washington, as well as those grown at Clatsop, Oregon. The plant packages and distributes fresh berries, cranberry sauce, and a recently developed juice that is becoming a favorite refreshment in many places. At the peak of operations the output of processed cranberries at this plant exceeds 215,000 cans and 65,000 pounds of fresh berries per day.

LAND IMPROVEMENT THROUGH BRUSH CONTROL

By Harry M. Elwell

MILLIONS of acres of land produce little of value because scrubby, woody vegetation prevents the growth of desirable grasses, legumes, or trees. Scientists are rapidly developing methods for conversion of brush lands to greater production through new and more efficient control methods.

Cooperative investigations have been conducted during the last 25 years by brush-control researchers of the Department of Agriculture and the Oklahoma Agricultural Experiment Station. Similar studies have been made in other States.

Investigators agree that site consideration is highly important in determining whether brushland can be profitably treated. The best methods for eliminating brush vary greatly because of the wide range of woody plants and grasses and the differences in climate and soil.

Before treating brush-infested land, the fertility level, depth, and erodibility of soil should be determined. Special precautions are

Note:—The author is research agronomist, Agricultural Research Service and Oklahoma State University, Stillwater, Oklahoma.

No. 58

This is the fifty-eighth of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.

This native grass pasture was covered with a dense stand of brush, similar to that seen in the background, before the brush was eliminated by spraying and clearing.

necessary during removal of brush from soils extremely low in fertility and readily subject to wind or water erosion.

Deep soil that can be cultivated after the brush is removed may be advantageously cleared by mechanical methods. Disk plowing the soil in the spring and fall for about 3 years will usually eliminate sprout growth. After the regrowth has been suppressed desirable grasses and legumes may be successfully introduced.

On the deep soil sites where timber production or growing of pecan or other nut-bearing trees is profitable, the weed-trees and brush species may be eliminated by hand cutting and treating of stumps with herbicides or by basal bark or injector treatments with 2,4,5-T.

In Oklahoma and other nearby States good control of post, blackjack, and dwarf chinquipin oaks and scrub hickory has been obtained from aerial spraying during active foliar growth (May 15 to July 15) with low-volatile esters of 2,4,5-T.

Three herbicide applications were necessary for kills approaching 100 percent of the oaks and hickory. The amount of low-volatile 2,4,5,-T ester for maximum kill has usually been 2 pounds of acid in 5 gallons of emulsion spray per acre for a first spraying with another 2 pounds 1 or 2 years later followed with 1 pound as a third application. Two aerial sprayings generally give 60-to-80 percent brush kill and permit good grass recovery.

Brush control has resulted in production of 2 to 5 times as much native grass as on untreated areas and the treated areas have remained free of woody-plant reinvasion for 6 to 8 years. It appears that such areas will not need control measures for several more years if good grazing practices are maintained.

Shinnery oak and mesquite can be effectively controlled with aerial

Disking cleared land with deep soil to kill sprouts and permit establishment of grass.

This type of wing-tip boom with 7 nozzles mounted on a light airplane delivers about 5 gallons of herbicidal spray per acre in a 40-foot swath.

applications of low-volatile esters of 2,4,5-T. These species are satisfactorily supressed with ½ pound of 2,4,5-T per acre. Retreatments of mesquite are usually required every 6 to 8 years. Shinnery oak usually needs 3 consecutive annual spray applications for maximum kills.

Elm, hawthorn, ash, mulberry, buck brush, and green briar have been resistant to 2,4,5-T in aerial spray applications. These species have been effectively controlled by ground treatments with 2,4,5-T. Buck brush and sumac have been effectively suppressed with applications of low-volatile and high-volatile esters of 2,4-D. As they approach full leaf, these species should be treated with 1 pound of 2,4-D acid per acre. Annual retreatments for several years have sometimes been necessary to eliminate buck brush.

Persimmon generally is not killed with 2,4,5-T aerial sprays, but it may be defoliated with 2,4,5-T or 2,4-D. On persimmon, 1 pound of acid of 2,4,5-T ester per acre applied as a ground spray has produced fair control. Two or three annual retreatments with the same amount of herbicide will usually give satisfactory control.

Drenching the foliage with herbicidal sprays applied from the ground has been effective in eliminating many non-commercial hardwood brush and tree species. For this type of treatment 2 to 4 pounds of low-volatile ester 2,4,5-T has been required to obtain good control. Annual retreatments often have been necessary to eliminate all the unwanted brush and trees.

Basal bark and stump applications, injections, and soil treatment have given effective killing of single plants of most hardwood species. Many brush plants not susceptible to foliage sprays may be killed with basal bark, injections, or soil applications.

Basal bark applications are made by mixing the esters of 2,4,5-T at 12 to 16 pounds of acid (3 to 4 gallons of herbicide) with 100 gallons of diesel oil or kerosene. This mixture should be applied to wet the lower 10 to 12 inches of the bark of each stem. The application should encircle the plant with some rundown of spray on the bark below the soil surface to control the dormant buds usually located just below the surface of the soil. These treatments have been most effective on plants less than 5 inches in diameter. Larger plants should be frilled with an ax before being treated. The ax incisions should be made to permit the herbicide-oil mixture to penetrate into the inner bark of the tree.

An injector has been an efficient tool for placing esters of 2,4,5-T—40 pounds (10 gallons) of acid

Applying foliar spray of 2,4,5-T ester to brush with a powered ground sprayer.

Equipment and methods used in basal bark and injection applications of 2,4,5,-T ester mixed with diesel oil.

mixed with 90 gallons of diesel oil —in the inner bark of trees. The injections for most of the woody species should be spaced 1 inch apart and encircle the plant. Injections made near the soil line permit the herbicide to be readily carried into the root system.

Basal bark and injection treatments have given satisfactory control when made throughout the year. But applications during the winter, when plants are dormant, are often preferred.

Sprouts on stumps have been prevented by applying sixteen pounds (4 gallons) of 2,4,5-T ester in 96 gallons of diesel oil or kerosene immediately after cutting. The edge of the cut and the bark on the stump to the soil-line need thorough treatment. Some rundown of spray on the bark below the soil surface is advisable.

Soil treatments have been made with monuron (3-(*p*-chlorophenyl) -1, 1-dimethylurea) and fenuron (3-phenyl-1, 1-dimethylurea) 80 percent wettable powder by mixing ⅛ to ¼ pound to 1 gallon of water and applying a band 6 inches wide on the soil around each plant. Pellets of these materials, at 25 percent concentration, have also been used. Fenuron has been most readily active on the majority of the woody species. Most of the oak species are affected with rates as low as 6 pounds of active chemical per acre. Higher rates give more consistently good results under variable soil and climatic conditions.

Monuron and fenuron are more effective on plants growing in sandy soils than on those in clay or clay loam soils.

Elms and persimmon have been killed with monuron and fenuron; they usually do not die, however, until the second year after being treated.

A lush stand of native grasses that developed in 2 years after brush was sprayed with 2,4,5-T ester.

The 2,4,-D and 2,4,5-T formulations are relatively low in toxicity to soil, man, animal, and most of the grasses. If not properly applied (particularly aerially) 2,4-D and 2,4,5-T may drift or float in air currents, and move from the area of application to adjacent areas and affect desirable field-crops or woody plants. However, they have been safely used for several years on pasture and range lands. Better ways are being developed for greater safety in their application.

Monuron and fenuron will often temporarily suppress native grasses, cause slight soil sterility, and are toxic to many of the desirable woody plants. Care should be taken not to apply these materials where they will be carried in runoff or irrigation water.

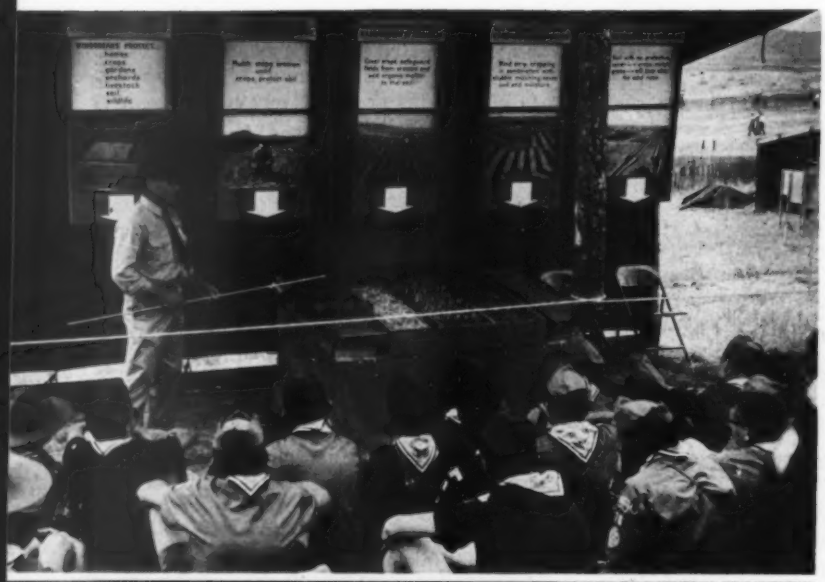
Management practices such as fire protection and deferred grazing have been valuable aids in establishing desirable vegetation on brush-infested areas that have been treated with chemicals. Areas that have been accidentally burned 1 and 2 years after being treated have had more root sprouts than unburned areas. Litter on unburned areas reduces wind and water erosion while the grasses are becoming established. The oaks and hickory plants dying from the effects of 2,4,5-T usually fall in small segments; thus there is very little possibility of injury to grazing livestock.

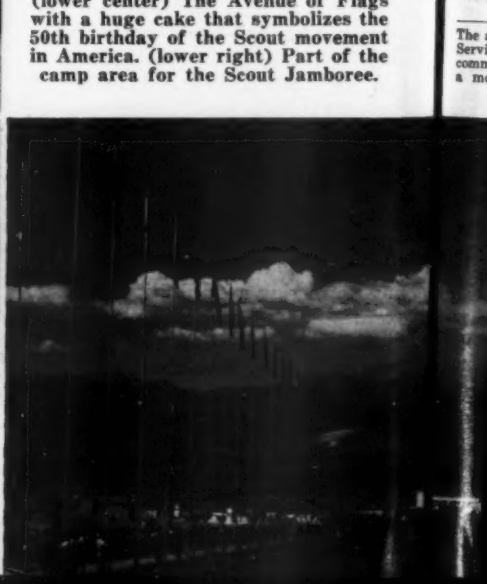
Deferred grazing on native rangelands from May 1 to October 15 for two seasons following application of 2,4,5-T has permitted the native grasses to develop an excellent sod, good forage production, and fair seed yields.

◆

Of the 90 new crop varieties released cooperatively by the U.S. Department of Agriculture and State experiment stations last year, more than half were developed with specific disease resistance in mind.

The





FROM the deserted mining camps high in the Rockies the shades of the bewhiskered oldtimers, who lived, dug, fought, and died there during the gold rush days must have looked down transfixed at what they saw. The magic that was taking place on the plain below the foothills overshadowed by far the fabled tent cities they had watched spring into being a century ago around Poverty Gulch and Leadville.

Pictures: (uper left) Soil Conservationist Ellis Lund explains wind erosion control to Scout audience. (left center) The author joins a Scout audience as range conservationist Raymond Thompson explains the life zones determined by climate and altitude. (lower left) Soil scientist Orville A. Parsons explains watershed exhibit to members of the Boy Scout Conservation Committee. From left: the author; Lou Klewer of Toledo; Walter Scherer of Ottawa, Ill.; Ted Pettit, Scout Conservation Director; Jack Culbreath of Washington, D. C.; and Ross Kreamer of Danville, Ky. (lower center) The Avenue of Flags with a huge cake that symbolizes the 50th birthday of the Scout movement in America. (lower right) Part of the camp area for the Scout Jamboree.

Conservation Bivouac—
The Fifth Boy Scout Jamboree

By Donald A. Williams

You would have to see personally what was happening—as I did—to get an inkling of the magnitude of it.

The fifth Boy Scout Jamboree, in the shadow of Pikes Peak north of Colorado Springs, was by all counts the largest of all the Jamborees, held usually each fourth year. (This year's Jamboree came after a three-year interval to coincide with Scouting's 50th birthday.) In pure statistics, the idea of 56,000 youngsters, in khaki shorts and knee socks, milling about the 2,300-acre tract may not be as impressive as the fact that their campfires took 20 carloads of charcoal and the milk they drank was equal to the daily production from 7,550 cows.

It took 70 special trains, 28 regularly scheduled trains, and untallied hundreds of buses and chartered planes to get them there.

The site was a broad expanse of conservation rangeland almost directly across Fountain Valley from the new Air Force Academy. It was a part of the R. E. Johnson ranch, with gently sloping hills and real evidence of conservation stewardship over a quarter-century.

Downslope from the 30-acre area devoted to soil, water, plant, and wildlife conservation exhibits and demonstrations were a clear, deep ranch pond, a small area developed for wildlife and, just above, a good example of erosion control work. The work on this ranch was a part of the earliest in soil and water conservation done in Colorado, on the Black Squirrel Demonstration Project.

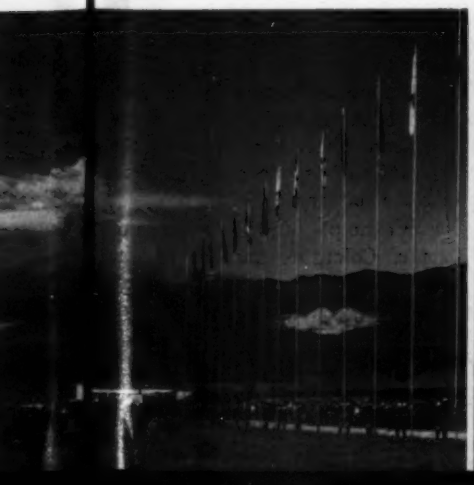
During all of the 25 years since elapsed, the rancher had been a dedicated steward of the soil. He had missed no opportunity to repair evidence of erosion or overuse of his lands and to give his range a chance to recover its native vigor.

Along with his interest in range conservation there had been a sincere desire to contribute personally to the needs and interests of his fellow man. His ranch has been available for many years for just such use as the Boy Scouts of America have made it. Few of the Scouts knew that the kindly rancher whose generosity had contributed to their Jamboree adventure died on the Monday of their Jamboree.

A good measure of credit for the achievement in getting the big site ready for the Jamboree must go to the joint efforts of our own forces of the Soil Conservation Service on State, area, and local staffs and to the boards of the Fountain Valley and the Centeral Colorado Soil Conservation Districts. You don't prepare for an event of this size in a month or two. In the fall of 1958, when it was known the Jamboree would be on this site, the Boy Scouts Jamboree Committee came to the SCS Colorado Springs staff and asked what might be done about building an amphitheater and grassing it.

Supervisors of the Fountain Valley district and SCS technicians looked over the 2,000-acre campsite and decided on a spot. The first step, after the site had been sur-

The author is Administrator, Soil Conservation Service. He is a member of the conservation committee of the Boy Scouts of America and a member of the Scouts' National Council.



veyed, was the shaping and grading of the 15-acre layout. El Paso County officials helped with equipment. The machines moved over 50,000 cubic yards of earth.

The district agreed to see to the job of grassing the slope, to the irrigation and the mowing. The snowy, rainy spring of 1959 delayed seeding, but by mid-May it was done, with bromegrass and perennial rye. Explorer Scouts of Colorado Springs pitched in by scattering hay to serve as mulch. (They used their earnings to help buy uniforms.)

It took a lot of irrigation to bring the grass stand through that dry and windy summer.

Bob Ermel, vice president of the Fountain Valley Soil Conservation District, took on much of the responsibility for the grassing work.

By Jamboree time the grassy green slope, with the stage below, was all that the officials and their 56,000 charges could desire.

One of the valued impressions that the young visitors have taken home with them undoubtedly has been that of the conservation story they heard on the hill overlooking the vast encampment. Here they visited, troop after troop, the exhibits and demonstrations where men of the Soil Conservation Service, Forest Service, Public Health Service, Bureau of Land Management, Weather Bureau, Geological Survey, and many Colorado State agencies explained how soil, water, forests, range, and wildlife all figured in their lives. The young listeners heard of the mysteries of the weather cycles, the importance of watersheds, and the relationships of sun, air, soil, and water to all living things.

A do-it-yourself demonstration where Scouts learn about soil testing.

To stand near while Soil Conservationist Joe Trierweiler of Buffalo, Wyo., Soil Scientist Dick Henderson of Littleton, Colo., Woodland Conservationist Ewing McClain of Raton, N. Mex., or Soil Conservationist Robert Richter of Holdrege, Nebr., recited their portions of the story of soil and water conservation gave me a renewed feeling of pride in our technical forces.

It was a delight to watch the rapt expressions of the Scouts as they sat in fan formation around the shelters. The talks and demonstrations were timed for 9-minute periods. You could tell the youngsters would have liked three times that interval at most of the stops. It was evident that the simplest of the demonstrations, too—the falling of water on soil or cover, the movement of water over miniature fields, the action of wind on loose soil or protected areas—were the lessons that seemed to make deep impressions on the young audiences.

Day after day, beginning with Wednesday, July 20, the columns kept coming, to see, hear, examine and reflect on the story told in words, photographs, and actions. It was regrettable that it was impossible for the entire encampment to have a chance to visit the conservation area.

It was stimulating to stop by the exhibits and demonstrations of our brother agencies, to see and hear their representatives give other chapters in the story of the outdoors. Especially impressive was the miniature mountain built by the Colorado Department of Game and Fish, depicting the effect of summer and winter conditions on wildlife.

And now and then along the way, a uniformed Scouter—at home an SCS technician—would come up to shake my hand. It would be interesting to know how many of our field forces are active in the Boy Scouts of America, helping to shape American character through the thousands of troops and cub dens over the country.

For example, Orville Parsons of Lamar, Colorado, another of our demonstration crew at the Jamboree, has given over 20 years of

Orville Parsons discusses soil and water conservation with a group of Scouts from Pennsylvania.

service to Scouting for which he holds a handful of awards, including the coveted "Silver Beaver."

This kind of service is one of the extracurricular phases of our work in which we can take a great deal of pride.

There are many others in our Service ranks who deserve a salute for their part in the Jamboree. There are Delbert Hanson of Randolph, Utah, and from Colorado bases, Raymond Thompson of Las Animas, Ellis Lund of Golden. And there are Clem Dodson of the State staff in Denver and Area Conservationist Dearl Beach at Colorado Springs.

Cashar Evans of Selbyville, Del., chairman of the youth committee of the National Association of Soil Conservation Districts, gave stout support to the soil and water conservation effort. In Scout uniform, he helped direct the visiting troops at the conservation entrance.

And a special word of thanks is in order for a veteran scout leader, Dr. Gerald M. Richmond, of the U. S. Geological Survey in Denver, who helped train 80 Denver Explorer Scouts to help with the conservation area at the Jamboree.

This was the third Jamboree in which the conservation of our soil and water resources was sharply accented. The emphasis in this one was the heaviest. The leaders of Boy Scouts of America are to be congratulated for their recognition of this opportunity to reach this portion of our youth with a story which will be vastly more important by the time five more Jamborees have passed.

A Look At the Future for

Scout Conservation Activities

By Irving J. Feist

WE all know that any Scouting conservation program is effective only to the extent that it reaches the boys—3½ million of them—who are registered in Scouting. For several years, the National Committee on Conservation of the Boy Scouts of America has been developing a program for Scout councils aimed in this direction. We have been actively promoting this program now for more than a year—and in those forty or so Scout councils with whom we have worked directly and personally, the program seems to be effective.

One of our major objectives for the future is to "sell" the following four-point program to each of the 540 councils in America: (1) Each council have a professional conservationist in a key volunteer position, to serve as advisor to the council on conservation programing and promotion; (2) each council have a long-range land use program for each acre of land it owns, and a written schedule for carrying out that plan; (3) each council have a carefully planned program of conservation activities for boys in camp, with a qualified staff man to direct that program; (4) each council develop a year-round program of conservation activities for all boys to work on in their home communities, with adequate trained leadership to guide these activities.

Another major project in the next few years will be the search for a better way of teaching conservation fundamentals to boys who

SCS technician explains the meaning of topsoil to a group of Scouts.

Note:—The author is chairman, National Conservation Committee, Boy Scouts of America, New Brunswick, N. J.

Scouts learn about the water cycle at the Philmont Scout Ranch, Cimarron, N. Mex.

live in metropolitan and suburban areas. We know that the bulk of our population lives in these areas, where they are far removed from the land and, in most cases, from actual conservation program opportunities as they are generally understood today. We know that the power of the vote is concentrated in large cities and suburban developments—yet all too many of our citizens have little awareness of resource use and conservation problems. We think we have a tremendous opportunity in citizenship training on conservation in these large population centers.

But we must discover the way to teach conservation to city boys, within the structure of the Scouting program. We have some ideas that we think will work. Our plan is to try them out in some selected areas and to set up some pilot projects. After serious study of the results, we hope to come up with a program of conservation for Scout units and individual boys right where they live—in cities or Levittowns across the country.

A third major point of emphasis is one which some of you readers know about, because you are working with us on this project. Briefly, it is this:

There are some 400,000 acres of land in Scout camps across the country. Councils are adding acreage every day—and some councils are losing their camps at the same time, losing them because they are wearing out.

We know now that recreational use can be just as hard on the land as agriculture or any other use. And all too often some of the same problems occur — sheet erosion, gullying, silted lakes and ponds, etc.

Our objective, with the help of the Soil Conservation Service, the Forest Service, the Bureau of Land Management, and the National Association of Soil Conservation Districts, is to select fifty or so camps from coast to coast and use them as "guinea pigs" in an effort to find out just how to manage a piece of property that is used for camping so that ten, twenty, or fifty years from now that property will have been improved with use and not destroyed. It's a big job, and an important one, if we hope to continue to have campsites where increasingly large numbers of boys

A scoutmaster explains some of the facts about wildlife conservation to a group of Scouts.

Scouts planting reed canarygrass on the shoreline of a pond near Lincoln, Nebr.

can get away from the city for a week or two each summer, and for several weekends during the year, to enjoy some of the benefits of outdoor living and outdoor education.

Still another major project is the completion of our Conservation Training Center in New Brunswick. We now have under construction on the National Office property in New Brunswick, N. J., a 22-acre nature and conservation demonstration laboratory. The purpose of this activity is the development of an outdoor laboratory or instruction center, where school classes, youth and adult groups, and the public in general may come to see and to learn.

One area of about eight acres will be devoted to fifty or sixty exhibits, demonstrations, and miscellaneous visual aids, all aimed at getting across some of the fundamentals of ecology in terms that anyone can understand. In so doing, we will have instruction centers in geology, climate and weather, soil, water, animal life, and plant life—with the emphasis on the interrelationships of these resources.

The application of ecological principles will be presented in a separate 12-acre conservation section, where on-the-ground examples of good conservation practices in soil and water, forestry, and fish and wildlife management are now being installed.

In time, we expect to install exhibits covering marine resources and their management, the use and conservation of mineral and fuel resources, and other phases of the total natural resource and conservation picture.

It is our hope that this project will serve as a pilot model for many Scout camps, and that sooner or later most of the ideas and teaching devices used here will be adapted and modified to fit in similar situations around the country. We've seen the effectiveness of this method of teaching conservation fundamentals—and the popularity of similar projects elsewhere. In this activity we think we can perform a tremendous public service far above our normal conservation education program.

In addition to these continuing activities on conservation, the National Jamboree of the Scouts features conservation every third or fourth year. At the Jubilee Jamboree held in July of this year near Colorado Springs, Colo., the conservation program and exhibits were especially impressive.

There, on about 20 acres, more than a hundred representatives of 22 private, State, and Federal conservation groups set up a series of conservation instruction stations designed to teach some of the more important conservation fundamentals to 50,000 or more boys and leaders during the last week of July.

The primary purpose of this activity, of course, was to teach some conservation fundamentals to a large group in a few days, and also dramatize conservation and make it more important in the eyes of boys. But this "spectacular" had another objective too—to set a pattern for a method of conservation education that could be adapted for use on the local level.

During the same period the Jamboree was being held in Colorado, local councils across the country held local Jamborees, most of which featured conservation in one way or another. Two outstanding ones in this respect were New York City and Bangor, Maine. Each of these cities featured conservation in its local programs in much the same way as was done at the National Jamboree. The total audience in New York was at least equal to that of the national event in Colorado.

These are some of the major projects that the Committee on Conservation for the Boy Scouts of America is now pushing. Other ideas and projects will doubtless develop in the future.

5,629 Cooperators

By John C. Beard

CAMP Perry, a 150-acre Boy Scout camp on the banks of the beautiful Arroyo Colorado near Rio Hondo, Texas, has joined the ranks of Cooperators in the Southmost Soil Conservation District.

The warm feeling one gets by helping a single farmer or rancher to conserve and improve his land was multiplied 5,629 times when the Scouts of the Rio Grande Valley Council developed and began to carry out a conservation plan.

All this happened when Scout officials, who represent the 5,629 Boy Scouts of the Council, signed a cooperative agreement to use the land within its capabilities and to

Note:—The author is work unit conservationist, Soil Conservation Service, San Benito, Tex.

treat it according to its needs for God, Country, and other Scouts yet to come!

Surrounded by thousands of acres of irrigated land, Camp Perry lies in its original state, except for the invasion of native brush which is very common in south Texas. The Boy Scouts have pledged to protect and improve the 150 acres for wildlife and recreation. Since their national theme for 1960 is "Physical Fitness and Conservation," what better project could they have?

During summer camp in 1959 all the Scouts had an opportunity to suggest treatments for wildlife food areas, gully control, brush control, and improvement of native grasses. The boys had a part in developing and recording their conservation plan.

District supervisors of the Southmost Soil Conservation District and Soil Conservation Service technicians are giving all the assistance possible to encourage the Scouts. Little encouragement is needed, however, since the whole plan is based on their ideas.

Scouts planting palm trees around the grounds of Camp Perry.

Two special food areas 100 feet square are being cleared of brush and planted to blue panicum grass for dove and quail. Brush piles are placed nearby for protection from predatory animals. Devices will be installed to provide water during periods of extended drought. A Scout troop is undertaking this project.

Fire lanes have been cleared around the entire camp and palm trees planted to add beauty. Over 1,000 palm trees have been planted.

Gullies that began to form along the steep banks of the Arroyo have been planted to grass and other areas having good cover are being protected.

Spoil banks made from dredging a ship channel are planned for wildlife food areas. Areas of thick undesirable brush will be thinned to give more sunlight to more useful plants.

A permanent Conservation Nature Trail is being set up by the Scouts and the soil conservation district supervisors. Signs, identifying plants and other interesting subjects, have been carved in wood and placed along the trail as permanent markers.

During June 1960 over 1,200 Scouts, Scoutmasters, and Leaders enjoyed the new Conservation Nature Trail. Twenty-four different groups were conducted on tours by the district supervisors, assisted by Soil Conservation Service technicians. Everyone attending Camp Perry saw the movies "A Heritage We Guard," "My Country," and "Bob White Through the Year."

There is no doubt that the Boy Scouts know that there's a Soil Conservation District in the Rio Grande Valley and that as a District Cooperator they are planning to do their share to conserve our natural resources.

Scouts are proud to show that their camp is cooperating with the local soil conservation district.

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Soil fertility has an effect on the prosperity of wildlife. This relationship is explained by Howard Wiegers, assistant professor of poultry husbandry at the University of Nebraska: "Plants grow in the soil and furnish food and shelter for both wild and domestic animals. It has been learned through experimentation that wild animals living in areas with the most fertile soils have grown heavier, yielded better furs, and even grown stronger bones than those from less fertile soils."

Contractor Plays "Boy At The Dike"

WHEN capricious Atlantic tides threatened success of a southern New Jersey small watershed project, contractor Frank Gaskill may have recalled the legend of the heroic Dutch lad who stuck his finger in the dike and saved his Netherlands village.

At any rate, Gaskill moved swiftly and in classic tradition. As rushing tides began—for the umpteenth time—to tear apart the almost-closed embankment being built to protect Lower Alloways Creek Township, he flung his automobile into the breach. The sedan temporarily plugged the hole while squadrons of earth-movers finished the re-filling job.

Scene of Gaskill's feat is the Silver Lake-Locust Island small watershed project, designed to protect 5,500 acres of farm, community, and wildlife land adjacent to Delaware Bay. The area had been at the mercy of the see-sawing ocean and tidal creeks since hurricanes tore through centuries-old dikes five year ago.

Engineering and land treatment work supervised by Soil Conservation Service specialists was begun early this year.

The dramatic moment came when the contractor's crew tried for 36 hours, around the clock, to plug the wavering 20- to 50-foot gap in the embankment at the precise instant of slack water between tides. By sacrificing his car to the elements, Gaskill slammed the door on the mighty Atlantic.

Pictures: (top) Euclids and bulldozers stockpile fill material while waiting for the tide to slacken so they can close the final gap of the fill. (center) Gaskill has driven his sedan as far out on the fill as he can and is leaving it so that the bulldozer can push it into the gap of the fill. (bottom) The sedan fills the breach as bulldozers rush to cover it with dirt and permanently close the gap in the dike.

Conservation Farmers Halt

Missouri's Little Dust Bowl

By Gaylord H. Wisner

DUNKLIN, like some other counties in southeast Missouri's "Bootheel," at one time had a severe wind erosion problem.

Before 1900 this area was in timber and wildlife was abundant. Intensive logging operations soon converted it to cropland. The balance of nature was upset and for a long period no educational program was in effect to stress proper land use. Soil-depleting crops and the consequent "burning out" of organic matter soon left the sand free to blow.

In an area of such complex economy, an exploitive type of farming left many undesirable conditions. Sand "blowouts" had not reached the point of abandonment, but large areas suffered disastrous soil losses each winter and spring. Dust darkened the sky. Topsoil drifted into fence rows. Highways and roads were covered. The most damaging result was the movement of sand particles along the surface of the ground at high velocities, causing severe destruction to young growing crops. Homemakers spent half their time dusting and laundering.

Sportsmen soon felt the effect of this miniature "dust bowl." Streams ran muddy and overflowed frequently while wildlife began to look for new homes. Big game, such as bear and deer, were the first to go; but for a short time small game and songbirds held their own. Then their good habitat began to disappear and in the winter ground cover was nonexistent.

Thinking people decided it was time for an "about face" and began to work toward a planned program of better land use.

In March 1949 Dunklin County farmers organized their soil conservation district. One of their first objectives was to encourage the use of cropping practices aimed at halting the perennial wind erosion hazard.

The district supervisors counseled with the Soil Conservation Service, the Extension Service, and other agricultural agencies as to the best approach. A known fact came to the mind of all concerned—that vegetation is a healer of nature and a nearly perfect soil conservation practice. They stressed the importance of seeding more and better winter cover and green manure crops, using a mixture of 20 pounds of hairy vetch and one bushel of rye per acre. This gave the answer and has proven to be the "back-

Note:—The author is work unit conservationist, Soil Conservation Service, Kennett, Missouri.

James Blanton displays organic matter in a cover crop that is being turned under as green manure in Dunklin County.

Sand drift in a fence row on a Dunklin County farm.

bone'' of our agricultural economy on sand-blow areas.

The rapid expansion of cover-cropping led to the widespread introduction of ''windstrip'' farming —the planting of a field in alternate strips of conventional row crops such as cotton, soybeans, or corn, while leaving a strip of cover crop between each intertilled crop. The width of the wind strips and intertilled strips depends on the degree of hazard—some soils are more vulnerable to wind erosion than others. Usually the intertilled strip is thirty rows wide and the wind strip 14 feet. After the crops on the wind strip mature they are harvested for seed. Strips laid out at right angles to the prevailing winds, usually from the southwest, are most effective.

For wildlife-conscious district cooperators, windstrip farming has provided ideal nesting sites for quail, songbirds, and other ground-nesting birds and excellent habitat for rabbits. The Missouri Conservation Commission has heartily endorsed this practice by publishing a feature article about it in their monthly magazine.

When sprinkler irrigation came along, farmers spaced and centered the windstrips to string sprinkler laterals. Some used these strips as lanes to operate a tractor to lay pipe.

The seeding of cover-green manure crops and strip farming seem to be here to stay as attested, since they are becoming more popular each year. Of the 200,000 acres once having a wind erosion problem in Dunklin County, 143,500 acres are now being stabilized annually through the use of windstrip cropping. In addition to being a soil builder through addition of nitrogen and organic matter, its chief function is mechanical protection of the soil and young tender plants from the abrasive action of blowing sand.

Wind stripcropping pattern now commonly seen in Dunklin County.

An educational program was set up in 1950 to bring the largest number of farmers into a planned action program as quickly as possible. The Kennett Chamber of Commerce, in cooperation with Radio Station KBOA and local newspapers, initiated a weekly ''Man On The Farm'' radio information program. This program is directed at farm people and emphasizes the windstrip cropping program of the district.

Soviet Hog Farm Nearly Buried by Dust Storm

Here's the way the Russian newspaper *Izvestiya* describes a dust storm at the Iskra hog farm in the Krasnodar area of U.S.S.R.

—Editor

A ''black storm'' obliterated the sun, choked off human breath, and caused the farm to become an island in a raging ocean of dust. Buildings were buried to their roofs. In the inner yard, the outlet for the water supply was covered, and part of a pond on the land was absorbed. Inside the buildings, hogs became buried, while sand on the roofs threatened their collapse.

The farm's 17 workers—most of them women—took the storm in stride, however, working around the clock to prevent loss of precious livestock. Keeping the water flowing was the first and most urgent job. At one point all 17 manned shovels in the nearly hopeless task of freeing the spigot of dust and debris. At last a tarpaulin was used to shield two men who scooped up bucketsful of dust and hoisted them on ropes up over the roof.

Meanwhile, women hog-tenders climbed through barn windows and worked to the point of exhaustion digging out the hogs. When the need for additional water became great, they brought it from the pond in buckets, despite the fact that the drifting dust had created a miry shoreline into which they were drawn until they were covered with doughlike mud. Still they managed to bring back 325 pails of water for the farm's 650 hogs.

Then, at the height of the storm and in the middle of the night, some of the hogs started farrowing. All 17 workers were mustered to duty to dig open a barn window, remove its frame, and haul the hogs and their litters through it to safer quarters. Finally, even these quarters became unsafe because of the weight of the sand on their roofs. The already-exhausted hands went to work to clear the roofs. The strong wind kept blowing them off, but they persistently climbed back to continue the attack. At last, as though subdued by the strength of man, the wind died and the sun shone; the 17 workers viewed the clearing skies with dust-reddened but happy eyes.

Herbicides Control Weeds In Windbreaks

Studies at the Box Butte Experiment Station, Alliance, Nebr., indicate that three herbicides—karmex, simazine, and atrazine—will control weeds in windbreak plantings without injuring trees. The chemicals were applied in May 1959 and are still giving 100 percent control of weeds in the second growing season.

Karmex and simazine were applied at the rate of 4 pounds per acre, and atrazine at the rate of 2 pounds per acre. All three chemicals were applied with a pressure-type 3-gallon sprayer, in a band 4 feet wide down the tree row. The test plots included cedar and ponderosa pine trees ranging in age from 1 to 4 years.

F. S. Hurd of Oklahoma

F. S. HURD, frequently referred to in Oklahoma as "The Grand Old Man of Conservation," has long been a leader for conservation in these parts. After 22 years as chairman of the board of supervisors of the Arkansas-Verdigris SCD and at the age of 93, Mr. Hurd is still active and enthusiastic. His courage and willingness to venture into and support something new has been one of his outstanding traits.

In 1902, at the age of 35, Hurd decided to take all his assets and enter the banking business in the territory later to become Oklahoma. After visiting eight or ten older towns in Indian Territory, he decided he would cast his lot with a new town then being organized on the prairie about 20 miles southeast of the thriving village of Tulsa. One month after the first lot had been sold in the new townsite of Broken Arrow, F. S. Hurd bought two lots where the First National Bank now stands and six lots where his home is.

With no railroad or post office, but an abundance of grass and fertile soil stretching toward the Arkansas River to the south and west and the Verdigris River to the north and east, Hurd saw visions of a prosperous agricultural community.

A month later, he returned from Kansas City with a safe which he hauled cross-country from the nearest railroad at Catoosa. He placed it in the corner of a newly built frame real estate office and hung out his shingle. At first, he slept in his "bank" with a pistol under his head until a more secure place could be built.

In 1904, Indian land began to be sold and the white settlers began to plant corn, cotton, and other tilled crops in the area. Broken Arrow grew to be a prosperous agricultural community based on the high yields produced from the accumulated fertility of the newly turned sod. High yields, clean tillage, and straight-row methods of farming soon began to take their toll of soil on the slopes of this rolling prairie land.

By 1927 it had become evident to all who would look that something needed to be done. F. S. Hurd began talking with farmers, meeting with Vocational Agriculture instructors, and doing anything he could to encourage better farming methods.

In 1934 the Broken Arrow Soil Conservation Association was organized by Mr. Hurd and other community leaders and it persuaded the U.S. Soil Erosion Service to place a CCC camp in the area.

When Oklahoma passed a soil conservation district law in 1937, Hurd and his fellow workers were ready. In 1938, the Arkansas-Verdigris SCD was the first district activated in Oklahoma. At the age of 71, Mr. Hurd became the first chairman of the district board of supervisors, a position which he held continuously for 22 years until his retirement in March 1960.

F. S. Hurd.

In February 1939, Mr. Hurd met with representatives of the other soil conservation districts in Oklahoma to form the Oklahoma Association of Soil Conservation Districts. He became its first secretary-treasurer.

When the "Friends of the Land" was organized in Washington, D. C., in 1940, Hurd was elected a vice president and member of the board of trustees.

For 11 years Hurd was Chairman of the Agricultural Commission of the Oklahoma Bankers Association. It was during this time that he initiated the Bankers Awards program. The first such awards were made in August 1942 to farmers for outstanding conservation work in the Arkansas-Verdigris SCD. From this beginning the Bankers Award program has spread throughout Oklahoma and many other States.

Mr. Hurd's understanding of agricultural problems was recognized in March 1942 when he was called to New York City by the American Bankers Association to represent the Tenth Federal Reserve District on the Food-for-Freedom Committee.

Through all the years, Hurd has been ready to do and to encourage anything which would help get conservation on the land. Very early it was found that rock phosphate was needed on the soil. No dealers were willing to handle it, so the district ordered carload after carload until a dealer was found. When mechanical bermudagrass planters were needed, Hurd encouraged a manufacturer to build them and the district bought the first machine. When new grasses appear which offer unusual promise, Hurd is ready to encourage their use.

The most recent emphasis of the district is on upstream flood prevention. Three separate projects are in various stages of planning. Although he has now turned the reins of active management over to another, Hurd's fondest wish is that he might live to see one of these projects completed and functioning.

—WILBER E. PARRISH

Close-Drilled Corn for Silage

Two South Carolina farmers are growing corn for silage in a new way. E. B. Mack of North and Joe E. Jones of Florence drilled the corn in 7-inch rows with a grain drill.

Mr. Mack planted corn in this way on 20 acres of land. He used 6½ bushels of seed per acre and applied 1,500 pounds of fertilizer per acre. He irrigated the corn twice. The corn was cut for silage when about head tall and yielded about 30 tons per acre. There was no grain on the stalks.

"Corn makes an excellent erosion-control crop when planted in this manner," said J. T. McAlister, SCS conservation equipment engineer at Orangeburg.

Mr. Jones planted 3½ bushels of corn per acre and fertilized with 1,000 pounds of 5-10-10 per acre. The corn produced 35 tons of forage per acre in a six-week growing period. He plans to grow two crops on the same land in one growing season by following this system of planting and harvesting.

Both of these dairy farmers are cooperators with their local soil conservation districts. Their goal in applying the soil and water conservation plans for their farms is to produce an abundance of high-quality forage and other feed for their cows and to conserve and build up their soil at the same time.

The Mail Goes Through —Rain or Shine

By J. S. Livingston and J. F. Murphree

RURAL mail carriers usually are familiar with soil conservation activities along their routes but seldom derive any direct benefit from such work. Not so R. M. Singletary, Jr., who "carries the mail" on Route 1 from Cross, South Carolina. He claims that the conservation work along his route helps him deliver the mail more punctually.

Recently a group of farmers in the area applied to the Berkeley Soil Conservation District for help in draining their fields. The area involved 19 farms.

Soil Conservation Service technicians assisting the Berkeley district planned a drainage system for the area as a part of the conservation plans for the farms. ACP payments helped get the job done.

No new land was brought into cultivation—just better drainage for fields which in the past had become waterlogged after each rain.

In commenting on the value of drainage to the community and to himself, in particular, Mr. Singletary said: "The drainage work done on the cropland adjoining the Spring Plain Road now allows continuous travel. Before it was done, large portions of cropland and road were covered with water during heavy rains and it was difficult and at some points impossible to get through. When heavy rains came I continued mail service by use of a jeep. Even with this mode of transportation, it was necessary to detour and in some cases travel through high points in the fields to reach all box holders. I'm glad to see farmers draining their land. Where roads are involved it always makes them better and I prefer to carry the mail in my sedan rather than in a jeep."

Note:—The authors are, respectively, work unit conservationist and soil conservationist, Soil Conservation Service, Moncks Corner, S. C.

R. M. Singletary (left) and soil conservationist John Murphree look at drainage ditch for cropland that has helped make county road passable during wet weather.

No State highways were involved, but the county road department worked closely with the district on this drainage project. Culverts already installed were increased in size and others added where needed to provide outlets from farm ditches and drains. The road serves about 50 families and the drainage has made wet-weather travel possible.

Increased Efficiency on British Farms

In Britain there are roughly 30,000,000 acres of farmed land. Another 16,000,000 acres are classified as "rough grazing" and consist mainly of hills. There are some large farms, but small ones predominate. Disregarding the smallest, which are often worked on a part-time basis, approximately two-fifths of the farms are less than 50 acres, and another two-fifths are between 50 and 150 acres.

Despite its small size, Britain varies greatly in its farming conditions. The south and east parts are generally flat, with annual rainfall from 20 to 30 inches; here arable farming is important. Farther north and west the rainfall is higher and the land more hilly, with the result that the land is mostly under grass, and livestock play a bigger part in farming systems. For the country as a whole, 63% of the farmland is in grass, either permanently or temporary grass sown down for from three to seven years; the percentage of grassland varies from 15 to 85 between counties.

Agricultural production has increased by 60% since 1939, despite loss of land to buildings, roads, airports, and other nonagricultural uses, and despite a drop of 10% in the number of farm workers. Only one twenty-fourth of today's working population is employed in agriculture. But crop yields per acre have risen by about one-third, as have milk yields per cow, which now average 750 gallons for all the cows in the country.

Many factors have contributed to increased efficiency. Mechanization has played a big part. Although Britain is not thought of primarily as an agricultural nation, it is believed to be the most highly mechanized agricultural estate in the world. The first stage of mechanization—the simple displacement of horses by tractors—is now virtually complete; the number of tractors has increased tenfold to the present figure of about 500,000. And good progress has been made with the second stage, equipping the tractor with its own implements and controls so that it can do much that horses could never do. More advances in mechanization will certainly come, and already the first steps in the application of electronics to farming have been taken. Fertilizer usage has reached a high level, though there is room for more generosity to grassland; and application of lime, favored by government grant, is well organized so that acidity now rarely limits production from the land.

Anyone familiar with British farming before 1939 would scarcely recognize it today. Progress has been due largely to the great scientific advance that has occurred since then; and it is certain that only by further application of science to farming can that progress continue.

—British Affairs

There is only one sure way to find out whether your crops are getting enough of the nutrients they need—a soil test.

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Farmers today are getting 76 percent more nutrients per ton of mixed fertilizer than they got 30 years ago.

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Geneticists are hoping to introduce nematode resistance into sugarbeets by manipulating chromosome numbers, according to Agricultural Research Service scientists.

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In 1939, U.S. farmers produced 2.5 billion bushels of corn on 88 million acres. In 1959, they produced 70 percent more corn on 4 percent fewer acres.

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In the past 20 years, the human race has increased in numbers by about 700 million. In the next 20 years, well over 1 billion people will be added if the present growth rate continues.